

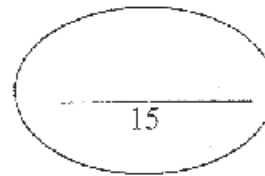
Name:

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University Of Bahrain
College of Information Technology



1st Exam
April, 2007

Subject: Computer Networking I ; ITCE314

Lecturer: Pr. H. Al-Rawi

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Note:

1. Answer All Questions.
2. Time: 1:00 Hours.
3. Use pen or ball pen ONLY!

Q1. Consider sending a file of 60000 bytes over a path of 5 links. Each link transmits at 10kbps. The network is lightly loaded so that there are no queueing delays. Propagation delay is negligible. Consider setup time whenever present as 20 ms. Header of 20 bytes is used in all cases.

- i. Assume the file is broken up into 40 packets:
 - (a) Suppose the network is a packet-switched virtual-circuit network. How long does it take to send the file from source to destination?
 - (b) Suppose the network is a packet-switched datagram network, and a connectionless service is used. How long does it take to send the file?
 - (c) Suppose that the network is a circuit switched network. How long does it take to send all packets?
- ii. Assume the message is not broken into packets:
 - (d) Suppose the network is a message-switched datagram network, and a connectionless service is used. How long does it take to send the file?
 - (e) Suppose that the network is a circuit switched network. How long does it take to send the file?

(5 Marks)



Q2. Correct if not true:

- a. It is worth emphasizing that the Web is a separate network that uses the communication services provided by the Internet.
- b. When a new network is added to the Internet, its administrators need to report which end systems are connected to that network. Similarly, an exiting network needs to report its changes in connected end systems to some central authority.
- c. The Internet's principle protocols are collectively known as TCP/UDP protocols.
- d. In the Internet, connection-oriented service guarantees that no data transmitted from a sender to a receiver will eventually be delivered to the receiver in-order and in its entirety. ~~correction~~ service do make guarantees about eventual delivery.
- e. A developer creating an Internet application (e.g., an email application, a file transfer application, a Web application or an Internet phone application) should program the application ~~not to~~ use one of the four connection services provided by the Internet.
- f. By reliable data transfer, we mean that an application can rely on the user to deliver all of its data without error and ~~out of~~ order.
- g. The Internet's ~~congestion~~ control service makes sure that both sides of a connection overwhelm the other side by sending too many packets too fast.

- h. Proponents of ~~(packet)~~ switching have always ~~argued~~ that ~~(circuit)~~ switching is wasteful because the shared circuits are idle during ~~silent~~ periods.
- i. In a router, if an arriving packet needs to be transmitted across a link but finds the link busy with the ~~transmission~~ of another packet, the arriving packet must wait in the output buffer. Thus, in addition to the store-and-forward delays, packets suffer output buffer processing delays.
- j. Although packet switching and circuit switching are both very prevalent in today's telecommunication networks, the trend is certainly in the direction of circuit switching.

(5 Marks)

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- Q3. A physical link of 1Mbps is to be used to connect pairs of communicators 10km apart using circuit switching. Propagation speed is 2.5×10^8 mps.
- (a) Give your suggestion to connect those communicators if each pair requires 10kbps.
 - (b) What is the maximum number of pairs you can support using the given link.
 - (c) If a file of size 400000bytes is to be sent between one pair; what is the maximum number of bits that will be in the link at any given time.
 - (d) How long it takes to transfer 10 packets of size 11000bits per packet between one pair;
 - (e) If 50% of the users are idle 60 percent of the time; at what bit rate can the other users send and how many more users can be served.

(5 Marks)